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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/636,023	08/07/2003	Kuo-Yuin Li	LELI 3493	1020
321	7590	06/03/2005	EXAMINER	
SENNIGER POWERS LEAVITT AND ROEDEL ONE METROPOLITAN SQUARE 16TH FLOOR ST LOUIS, MO 63102			NGUYEN, THANH NHAN P	
			ART UNIT	PAPER NUMBER
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DATE MAILED: 06/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/636,023	Applicant(s) LI, KUO-YUIN	
	Examiner (Nancy) Thanh-Nhan P. Nguyen	Art Unit 2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 March 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/3/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This communication is responsive to Amendment dated 3/3/2005.
2. Claims 1-19 are presented for examination.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, and 4-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito U.S. Patent Application Publication No. 2001/0028412 in view of Davis et al U.S. Patent No. 5,822,029.

Referring to claim 1, Ito discloses a projection illumination device, comprising a light source (11, and 14) providing parallel light beam along a light axis; and a wire grid polarizer (40B) substantially perpendicular to the light axis, [see fig. 7].

Ito lacks of disclosing a quarter-wave retardation being disposed near the light source, and substantially perpendicularly to the light source; and the quarter-wave retardation being parallel with the wire grid polarizer.

Davis et al discloses the quarter-wave retardation (38) being disposed near light source, and being parallel to the filter (18), which functions as the wire grid polarizer for light recycling, [see fig. 5, and col. 5, lines 11-15], for the benefit of reducing the amount of light lost. Therefore, at the time the invention was made, it would have been obvious

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to a person of ordinary skill in the art to have a wire grid polarizer being disposed parallel to the quarter-wave retardation, and for being associated with the quarter-wave retardation to polarize the light beams from the light source for the benefit of reducing the amount of light lost.

Referring to claim 2, it was well known that adhering layers together was to prevent Newton's rings. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have the quarter-wave retardation adheres to the illuminated surface of the wire grid polarizer for the benefit of preventing Newton's rings.

Referring to claim 4, Ito discloses the projection device, further comprising a lens array (220) disposed between the light source and the quarter-wave retardation and being substantially perpendicularly to the light axis, thereby preliminarily unifying the light beams from the light source, [see fig. 7].

Referring to claim 5, to get 90 degree rotation for light recycling, the quarter-wave retardation has a slow axis, the wire grid polarizer has an absorption axis, of which the slow axis and the absorption axis define an included angle of substantially 45 degrees is required. Therefore, it would have been obvious to a person of ordinary skill in the art to have the slow axis of the quarter-wave retardation, and the absorption axis of the wire

grid polarizer define an included angle of substantially 45 degree for the benefit of improving the efficiency of the liquid crystal display.

Referring to claim 6, Ito discloses wherein the light source further comprising a lamp (11) and a parabolic lampshade (14), of which the lamp is disposed at the focus of the parabolic surface of the lampshade for providing the parallel light beams, [see fig. 7].

Referring to claim 7, Ito discloses the projection illumination device, further comprising a condenser (224), and a relay (39), the condenser is used for unifying a shape of the light beams, and the relay is used for concentrating and collimating the light beams, [see fig. 7].

Referring to claim 8, Ito discloses an LCD projection system, comprising a projection illumination device as claimed in Claim 1 for providing polarized light, [met claim 1 rejection]; and an imaging apparatus for receiving the polarized light from the projection illumination device in order to project an image, [see fig. 7].

Referring to claim 9, Ito discloses the LCD projection system, wherein the imaging apparatus comprising a color selector (color separation 100), two liquid crystal panels and a lens (90), of which the color selector is adapted for selecting the desired

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color and its complementary color, and the two liquid crystal panels are adapted for producing the image and projecting the image through the lens, [see fig. 7, and 24].

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ito in view of Davis et al as discussed above, and further in view of Yamagishi U.S. Patent No. 5,777,695.

Referring to claim 3, Ito lacks of disclosing the projection illumination device, further comprising a transparent glass plate that adheres to the quarter-wave retardation.

Yamagishi discloses the projection illumination device comprising a transparent glass plate (28) that adheres to the quarter-wave retardation (29), [see fig. 7], for the benefit of improving the light utilization efficiency, [see col. 11, lines 45-46].

Claim 10 is rejected under 35 U.S.C 103(a) as being unpatentable over Ito in view of Davis et al, and further in view of Li U.S Patent Application Publication No. 2005/0073653.

Referring to claim 10, Ito discloses a projection illumination device, comprising a light source (11, and 14) providing parallel light beam along a light axis; and a wire grid polarizer (40B) substantially perpendicular to the light axis, [see fig. 7].

Ito lacks of disclosing a quarter-wave retardation being disposed near the light source, and substantially perpendicularly to the light source; and the quarter-wave retardation being parallel with the wire grid polarizer.

Davis et al discloses the quarter-wave retardation (38) being disposed near light source, and being parallel to the filter (18), which functions as the wire grid polarizer for light recycling, [see fig. 5, and col. 5, lines 11-15], for the benefit of reducing the amount of light lost. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have a wire grid polarizer being disposed parallel to the quarter-wave retardation, and for being associated with the quarter-wave retardation to polarize the light beams from the light source for the benefit of reducing the amount of light lost.

Ito further lacks disclosure of only p-polarized light can pass through the wire grid polarizer, and the non p-polarized light that cannot pass through the wire grid polarizer is reflected.

Li discloses only p-polarized light (768) can pass through the wire polarizer (766), and the non p-polarized light (770) that cannot pass through the wire grid polarizer is reflected, [see fig. 7], for the benefit of having light recovery in projection systems that might otherwise be wasted, [see par. 0002]. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have only p-polarized light can pass through the wire grid polarizer, and the non p-polarized light that cannot pass through the wire grid polarizer is reflected for the benefit of having light recovery in projection systems that might otherwise be wasted.

Claims 11-12, and 14-19 are rejected under 35 U.S.C 103(a) as being unpatentable over Ito U.S. Patent Application Publication No. 2001/0028412 in view of Li U.S Patent Application Publication No. 2005/0073653.

Referring to claim 11, Ito discloses a projection illumination device comprising a light source having reflecting surface (14); and a polarizer (40B) allowing light of a first polarity to pass through while reflecting light of a second polarity, [see fig. 7].

Ito lacks disclosure of a retardation generating a phase difference of a quarter period between light before and after passing through the retardation; and the light source emits a light beam passes through the retardation to the polarizer so that light of the first polarity in the light beam passes through the polarizer while that of the second polarity is reflected by the polarizer through the retardation to the reflecting surface and further reflected by the reflecting surface through the retardation to the polarizer.

Li discloses a retardation (772) generating a phase difference of a quarter period between light before and after passing through the retardation; and the light source (708) emits a light beam passes through the retardation to the polarizer (766) so that light of the first polarity (768) in the light beam passes through the polarizer while that of the second polarity (770) is reflected by the polarizer through the retardation to the reflecting surface and further reflected by the reflecting surface through the retardation to the polarizer, [see fig. 7], for the benefit of having light recovery in projection systems that might otherwise be wasted, [see par. 0002]. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have a retardation generating a phase difference of a quarter period between light before and

after passing through the retardation; and the light source emits a light beam passes through the retardation to the polarizer so that light of the first polarity in the light beam passes through the polarizer while that of the second polarity is reflected by the polarizer through the retardation to the reflecting surface and further reflected by the reflecting surface through the retardation to the polarizer for the benefit of having light recovery in projection systems that might otherwise be wasted.

Referring to claim 12, it was well known that adhering layers together was to prevent Newton's rings. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have the quarter-wave retardation adheres to the illuminated surface of the wire grid polarizer for the benefit of preventing Newton's rings.

Referring to claim 14, Ito discloses the projection device, further comprising a lens array (220) disposed between the light source and the quarter-wave retardation and being substantially perpendicularly to the light axis, thereby preliminarily unifying the light beams from the light source, [see fig. 7].

Referring to claim 15, to get 90 degree rotation for light recycling, the quarter-wave retardation has a slow axis, the wire grid polarizer has an absorption axis, of which the slow axis and the absorption axis define an included angle of substantially 45 degrees is required. Therefore, it would have been obvious to a person of ordinary skill

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in the art to have the slow axis of the quarter-wave retardation, and the absorption axis of the wire grid polarizer define an included angle of substantially 45 degree for the benefit of improving the efficiency of the liquid crystal display.

Referring to claim 16, Ito discloses wherein the light source further comprising a lamp (11) and a parabolic lampshade (14), of which the lamp is disposed at the focus of the parabolic surface of the lampshade for providing the parallel light beams, [see fig. 7].

Referring to claim 17, Ito discloses the projection illumination device, further comprising a condenser (224), and a relay (39), the condenser is used for unifying a shape of the light beams, and the relay is used for concentrating and collimating the light beams, [see fig. 7].

Referring to claim 18, Ito discloses an LCD projection system, comprising a projection illumination device as claimed in Claim 11 for providing polarized light, [met claim 1 rejection]; and an imaging apparatus for receiving the polarized light from the projection illumination device in order to project an image, [see fig. 7].

Referring to claim 19, Ito discloses the LCD projection system, wherein the imaging apparatus comprising a color selector (color separation 100), two liquid crystal panels and a lens (90), of which the color selector is adapted for selecting the desired

color and its complementary color, and the two liquid crystal panels are adapted for producing the image and projecting the image through the lens, [see fig. 7, and 24].

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ito in view of Li as discussed above, and further in view of Yamagishi U.S. Patent No. 5,777,695.

Referring to claim 13, Ito lacks of disclosing the projection illumination device, further comprising a transparent glass plate that adheres to the quarter-wave retardation.

Yamagishi discloses the projection illumination device comprising a transparent glass plate (28) that adheres to the quarter-wave retardation (29), [see fig. 7], for the benefit of improving the light utilization efficiency, [see col. 11, lines 45-46].

Response to Arguments

1. Applicant's arguments filed 3/3/2005 have been fully considered but they are not persuasive.

Applicant's argument: On the Remarks, pages 8-9, referring to Ito reference, applicant's opinion is that the element (40B) in Fig. 7 only refers to a conventional PS converter (14) as shown in figs. 1-3 of the present application, rather than a wire grid polarizer as claimed. And two lens arrays (220, 203) are needed and must be aligned and fit the polarization conversion element (40B), which increases the manufacturing difficulty and cost, and makes no improvements in light illumination efficiency.

Examiner's reply to the argument: The element (40B) in Ito reference is a polarization conversion element, and is still considered as a wire grid polarizer since it converts a light beam into a single kind of a linearly polarized light beam. The wire grid polarizer as claimed in application would function the same as element (40B). Examiner would like to point out that the difference in the projection illumination device between application and Ito is that there is a quarter wave retardation placed in front of the wire grid polarizer. And for this missing element, which is a quarter wave retardation, Examiner already admitted in the previous rejection, and already provided Davis reference as secondary reference.

Further, Examiner think that applicant might have made a good point about the elements used in Ito projection illumination device, which might increase the manufacturing difficulty and cost, and make no improvements in light illumination efficiency. However, Ito reference still reads on the limitations in the claims of application. Therefore, Ito reference is applicable to use.

Applicant's argument: On the Remarks, page 9, referring to Davis reference, "... each region of the filter 18 transmits only one of the three primary light wavelengths, the other two wavelengths being excluded. This is very different from the claimed invention. In the invention, only p-polarized light can pass through the wire grid polarized, and non p-polarized light is reflected to further transform to another polarizable light."

Examiner's reply to the argument: First, "only p-polarized light can pass through the wire grid polarized, and non p-polarized light is reflected to further transform to another polarizable light" has only discussed in application specification, and just mentioned in new claims added when amended, i.e. claim 10. Second, each region of the filter 18 transmits one of the three wavelengths, the other two wavelengths being reflected. The light which is reflected by the filter 18 returns through the circular polarizer 16 which converts the left handed circularly polarized into linearly polarized light which is reflected by the reflector 12, and returns through the circular polarizer 16 to be incident upon the filter 18 once more. Any component of the light which is again reflected by the filter 18 will once more be reflected by the reflector 12 and filter 18 until the light is incident upon a region of the filter 18 which transmits light of that wavelength band, [see col. 2, lines 59-66; col. 3, lines 2-6]. Therefore, Davis reference is still applicable to use.

Thus, the previous rejection for claims 1-9 is still maintained.

2. Applicant's arguments with respect to claims 10-19 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to (Nancy) Thanh-Nhan P. Nguyen whose telephone number is 571-272-1673. The examiner can normally be reached on M-F/9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on 571-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

May 27, 2005

TN



DUNG T. NGUYEN
PRIMARY EXAMINER